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Πίνακας περιεχομένων

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# Ecology

## Unit 1

Ecology (from Greek:σπίτι, "house", or "environment"; -πνευματώδη, "study of")[A] is the branch of biology[1] which studies the interactions among organisms and their environment. Objects of study include interactions of organisms with each other and with lifeless components of their environment. Topics of interest include the biodiversity, distribution, biomass, and populations of organisms, as well as cooperation and competition within and between species. Ecosystems are dynamically interacting systems of organisms, the communities they make up, and the non-living components of their environment. Ecosystem processes, such as primary production, kids born, nutrient cycling, and niche construction, regulate the flux of energy and matter through an environment. These processes are sustained by organisms with specific life history traits. Biodiversity means the varieties of species, genes, and ecosystems, enhances certain ecosystem services.

Ecology is not synonymous with environmentalism, natural history, or environmental science. It overlaps with the closely related sciences of evolutionary biology, genetics, and ethology. An important focus for ecologists is to improve the understanding of how biodiversity affects ecological function. Ecologists seek to explain:

Life processes, interactions, and adaptations

The movement of materials and energy through living communities

The successional development of ecosystems

The abundance and distribution of organisms and biodiversity in the context of the environment.

Ecology has practical applications in conservation biology, wetland management, natural resource management (agroecology, agriculture, forestry, agroforestry, fisheries), city planning (urban ecology), community health, economics, basic and applied science, and human social interaction (human ecology). For example, the Circles of Sustainability approach treats ecology as more than the environment 'out there'. It is not treated as separate from humans. Organisms (including humans) and resources compose ecosystems which, in turn, maintain biophysical feedback mechanisms that moderate processes acting on living (biotic) and non-living (abiotic) components of the planet. Ecosystems sustain life-supporting functions and produce natural capital like biomass production (food, fuel, fiber, and medicine), the regulation of climate, global biogeochemical cycles, water filtration, soil formation, erosion control, flood protection, and many other natural features of scientific, historical, economic, or intrinsic value.

# Ecology and water

## Unit 2

The movement, distribution, and quality of water is the primary factor influencing wetland structure and function. To be classified as a wetland, the presence of water must contribute to the formation of hydric soils, which are formed under flooded or saturated conditions persisting long enough for the development of anaerobic conditions during the growing season (NRCS 1998). Water conditions in wetlands can vary tremendously with respect to the timing and duration of surface water inundation as well as seasonal patterns of inundation.

In coastal wetlands, tidal influence drives the movement and distribution of water and can range from permanent flooding in subtidal wetlands to less frequent flooding in others, with changes in water level occurring daily or semi-daily. Inland wetlands, which lack daily tidal influences, can also be permanently flooded on one extreme or intermittently flooded on the other extreme, with fluctuations over time often occurring seasonally. It is the balance of water inflows and outflows, or the water budget (Figure 1), as well as the geomorphology and soils that determine the timing, duration, and patterns of flooding in a wetland

# Ecology and forests

## Unit 3

Forest types are distinguished from each other according to species composition (which develops in part according to the age of the forest), the density of tree cover, type of soils found there, and the geologic history of the forest region.

Soil conditions are distinguished according to depth, fertility, and the presence of perennial roots. Soil depth is important because it determines the extent to which roots can penetrate into the earth and, therefore, the amount of water and nutrients available to the trees. The soil of taiga forests is sandy and quickly drained. Deciduous forests have brown soil, richer than sand in nutrients, and less porous. Rainforests and savanna woodlands have a soil layer rich in iron or aluminum, which give the soils either a reddish or yellowish cast. The amount of water available to the soil, and therefore available for tree growth, depends on the amount of annual rainfall. Water may be lost by evaporation from the surface or by leaf transpiration. Evaporation and transpiration also control the temperature of the air in forests, which is always slightly warmer in cold months and cooler in warm months than the air in surrounding regions.

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| LESSON | TOPIC | | ASSIGNMENT | Points | | DUE |
| 1 | What is Distance Learning? | | Wiki #1 | 10 | | March 10 |
| Presentation | 20 | |  |
| 2 | History & Theories | | Brief Paper | 20 | | March 24 |
| Spring Break | | | | | | |
| 3 | | Distance Learners | Discussion #1 | | 10 | April 7 |
| Group Project | | 50 | April 14 |
| 4 | | Media Selection | Blog #1 | | 10 | April 21 |

**Class Schedule**

# Ecology and animals

## Unit 4

Animal ecology concerns the relationships of individuals to their environments, including physical factors and other organisms, and the consequences of these relationships for evolution, population growth and regulation, interactions between species, the composition of biological communities, and energy flow and nutrient cycling through the ecosystem. From the standpoint of population, the individual organism is the fundamental unit of ecology. Factors influencing the survival and reproductive success of individuals form the basis for under-standing population processes.

Two general principles guide the study of animal ecology. One is the balance of nature, which states that ecological systems are regulated in approximately steady states. When a population becomes large, ecological pressures on population size, including food shortage, predation, and disease, tend to reduce the number of individuals. The second principle is that populations exist in dynamic relationship to their environments and that these relationships may cause ecological systems to vary dramatically over time and space. One of the challenges of animal ecology has been to reconcile these different viewpoints.

# Ecology and society

## Unit 5

Ecology and Society (formerly Conservation Ecology) is a quarterly open access interdisciplinary scientific journal published by the Resilience Alliance. It covers an array of disciplines from the natural sciences, social sciences, and the humanities concerned with the relationship between society and the life-supporting ecosystems on which human well-being ultimately depends. The journal's editors are Carl Folke (Stockholm Resilience Centre) and Lance Gunderson (Emory University). C. S. Holling was the founding editor.

Issues are available online as "in progress" as soon as articles are published. Special features are published separately throughout the year. Many of the articles in Ecology and Society are published as part of special features. Much of the research from a social-ecological systems perspective is published in Ecology and Society . Recent special features include "Understanding Human Resilience in the Context of Interconnected Health and Social Systems", "Advancing the Understanding of Behavior in Social-Ecological Systems: Results from Lab and Field Experiments", and "A Framework for Analyzing, Comparing, and Diagnosing Social-Ecological Systems."

According to the Journal Citation Reports, the journal has a 2016 impact factor of 2.8, and it ranks 20 of 105 journals in the field of Environmental Studies and 50 of 153 in the field of Ecology.[1]

As of January 2016, the three most cited articles from Ecology and Society were:

BH Walker, C.S. Holling, S.R. Carpenter, A Kinzig. 2004. Resilience, adaptability and transformability in social-ecological systems. Ecology and Society 9(2):5

J Rockström, W Steffen, K Noone et al. 2009 Planetary Boundaries: Exploring the Safe Operating Space for Humanity. Ecology and Society 14(2):32

DW Cash, NW Adger, F Berkes et al. 2006. Scale and cross-scale dynamics: Governance and information in a multilevel world. Ecology and Society 11(2):8

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